

1 Table 1 Mean values and standard deviation (SD) for different data groups.

Database	Number		Rainfall factors			Plot factors		Hydrological variables				
			Duration	Imax30	Depth	Coverage	ASMCM	RO	SL	P	N	COD
			h	mm	mm	%	moisture	m ³ /km ²	t/km ²	kg/km ²	kg/km ²	kg/km ²
							%					
High-intensity	267	Mean	9.27	22.61	47.68	44.51	18.22	8.04	569.65	3.65	23.43	72.87
event		SD	8.64	6.03	32.78	6.91	7.65	15.21	3478.08	8.36	36.38	110.32
Low-intensity	730	Mean	11.66	6.86	23.58	43.63	20.60	1.76	25.97	0.98	7.88	19.92
event		SD	10.84	3.63	18.24	3.31	7.68	4.64	130.21	3.65	18.71	57.29
Total	997	Mean	11.02	11.08	30.04	43.87	19.96	3.44	171.57	1.69	12.04	34.10
		SD	10.35	8.25	25.40	4.58	7.74	9.25	1819.34	5.47	25.66	78.82

2 Note: Imax 30: maximum rainfall intensity over a 30-min period; RO: runoff; SL: soil loss; P: phosphorus; N: nitrogen; COD: chemical oxygen demand. ASMC:
3 antecedent soil moisture content.

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5 Table 2 Structural equation model fitting statistical indices. GOFs: Goodness of fit indices system
 6 for different rainfall intensities.

	GOFs	Recommended levels	Value	
			High-intensity	Low-intensity
Model fit	p	>0.05	0.311298	0.055071
summary	χ^2/df	1-2	1.195225	1.848716
	RMSEA	<0.1	0.02729	0.03431
	CFI	>0.9	0.9998	0.9974
	NFI	>0.9	0.99787	0.99486
	IFI	>0.9	0.9998	0.9974
Evaluation			Acceptable	Acceptable

7 Note: χ^2/df : the quotient of the Chi square and the degrees of freedom; RMSEA: root mean
 8 square error of approximation; CFI: comparative fit index; NFI: the non-normed fit index; IFI:
 9 incremental fit index.

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11 Table 3 Stepwise multiple linear regression model results for nutrient levels.

Stepwise multiple linear regression equation	R ²	p value
P = 0.481 + 0.352 (RO)	0.355	<0.001
P = 0.551-1.244 + 0.3770.405 (RO) - 0.0380.027 (Depth) + 0.0880.233 (Imax30) -0.017 (Re)	0.38040 <u>7</u>	<0.001
N = 4.530 + 2.184 (RO)	0.619	<0.001
N = 10.359 + 2.131 (RO) - 0.291 (Moisture) + 0.001 (SL)	0.632	<0.001
COD = 12.074 + 6.401 (RO)	0.564	<0.001
COD = 18.963-279 + 6.152-594 (RO) -0.647-791 (Moisture) + 0.6211.571 (Imax30) -0.08 (Re)	0.57358 <u>1</u>	<0.001

12 | Note: P: phosphorus; N: nitrogen; COD: chemical oxygen demand; Re: rainfall erosivity.

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15 Table 4 Correlations between response variables and explanatory variables. I_{max30}: maximum rainfall intensity over a 30-min period; RO: Runoff depth; SL: Soil
 16 loss; P: Soil phosphorus loss; N: Soil nitrogen loss; COD: Chemical oxygen demand. Note: * p < 0.05. ** p < 0.01.

	Vegetation	<u>ASMC</u>	Duration	I _{max30}	Depth	<u>Re</u>	SL	RO	P	N	COD
Vegetation	1										
<u>ASMC</u>	0.018	1									
Duration	0.011	0.001	1								
I _{max30}	0.073*	-0.183**	-0.160**	1							
Depth	0.058	-0.214**	0.288**	0.475**	1						
<u>Re</u>	<u>0.106**</u>	<u>-0.234**</u>	<u>0.086**</u>	<u>0.753**</u>	<u>0.853**</u>	1					
SL	-0.035	-0.027	-0.018	0.177**	0.059	<u>0.114**</u>	1				
RO	-0.043	-0.098**	0.002	0.353**	0.510**	<u>0.553**</u>	0.149**	1			
P	-0.016	-0.055	-0.067*	0.275**	0.213**	<u>0.248**</u>	0.111**	0.596**	1		
N	-0.081*	-0.165**	0.013	0.312**	0.437**	<u>0.439**</u>	0.185**	0.787**	0.467**	1	
COD	-0.056	-0.146**	-0.027	0.331**	0.401**	<u>0.410**</u>	0.126**	0.751**	0.518**	0.770**	1

17 Note: I_{max 30}: maximum rainfall intensity over a 30-min period; RO: runoff; SL: soil loss; P: phosphorus; N: nitrogen; COD: chemical oxygen demand. ASMC:
 18 antecedent soil moisture content; Re: rainfall erosivity.

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20 | Table 5 Structural equation model fitting statistical indices for soil nutrient loss. GOFs: Goodness
 21 | of fit indices system.

	GOF	Recommended levels	Value		
			N	P	COD
Model fit	p	>0.05	0. 05 <u>257</u>	0. 121 <u>337</u>	0. 134 <u>150</u>
summary	χ^2/df	1-2	1. 253 <u>82</u>	1. 561 <u>123</u>	1. 387 <u>473</u>
	RMSEA	<0.1	0. 029 <u>016</u>	0.0 <u>1124</u>	0.02 <u>22</u>
	CFI	>0.9	0.99 <u>89</u>	0.998 <u>1.000</u>	0.999
	NFI	>0.9	0.997	0.99 <u>68</u>	0.99 <u>67</u>
	IFI	>0.9	0.99 <u>89</u>	<u>1.000</u> 0.998	0.999
Evaluation			Acceptable	Acceptable	Acceptable

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